

Figure 1 .

Set-associative caching device organized as
 M number of sets with N elements in each set.

10045127-102694

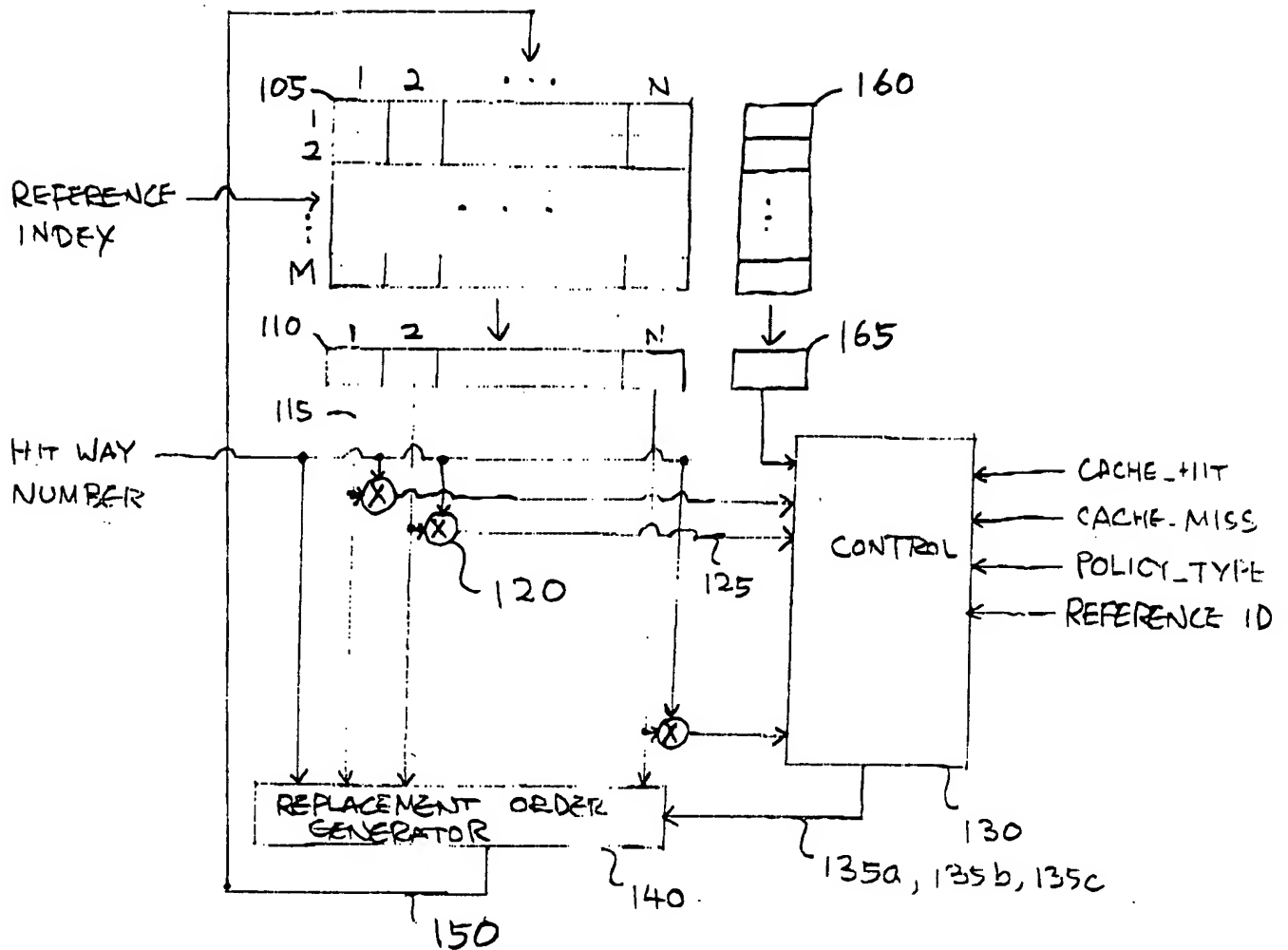


Figure 2

2100

Programmable replacement mechanism

10045127-102601

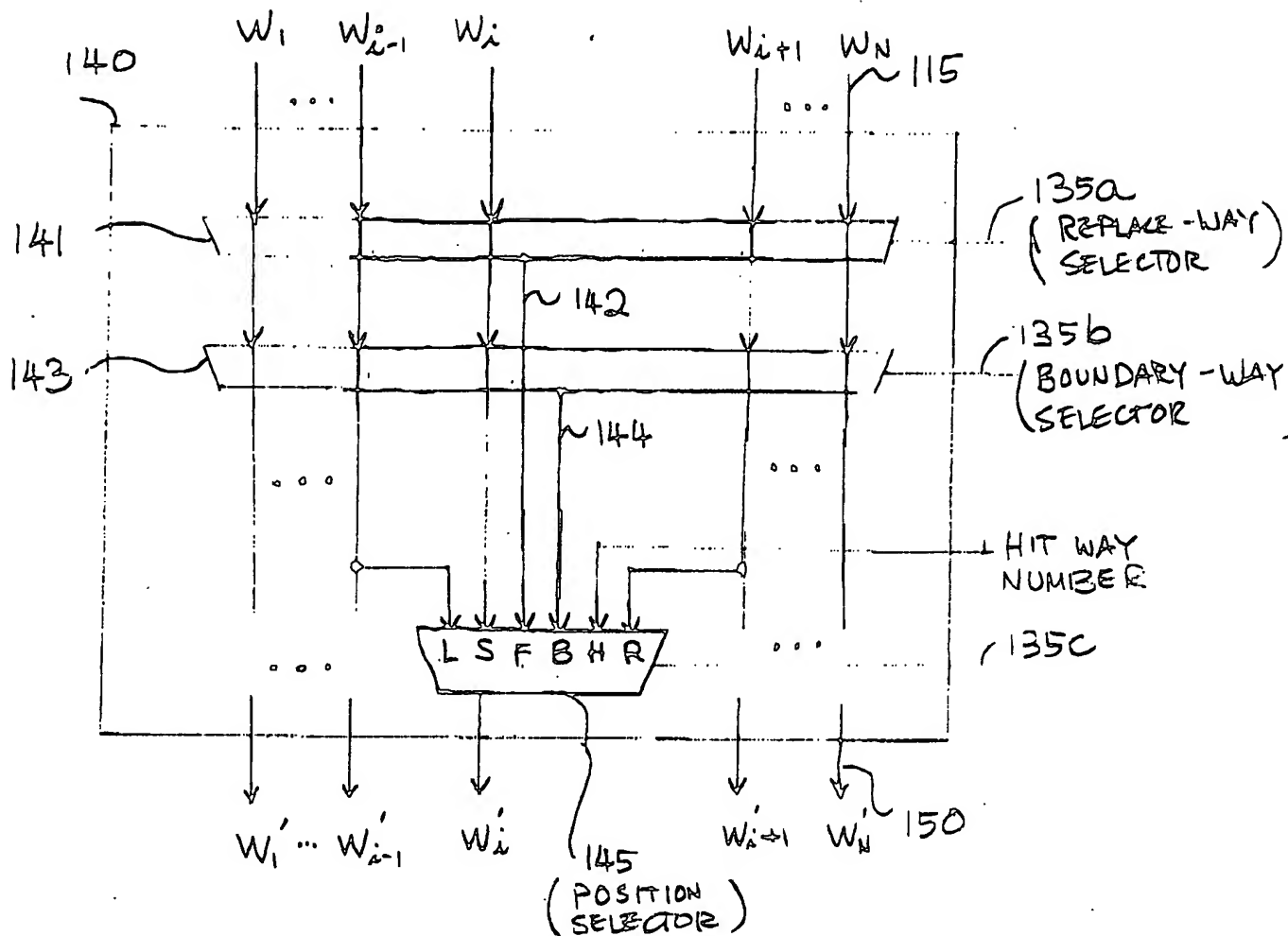


Figure 3

Replacement order generator

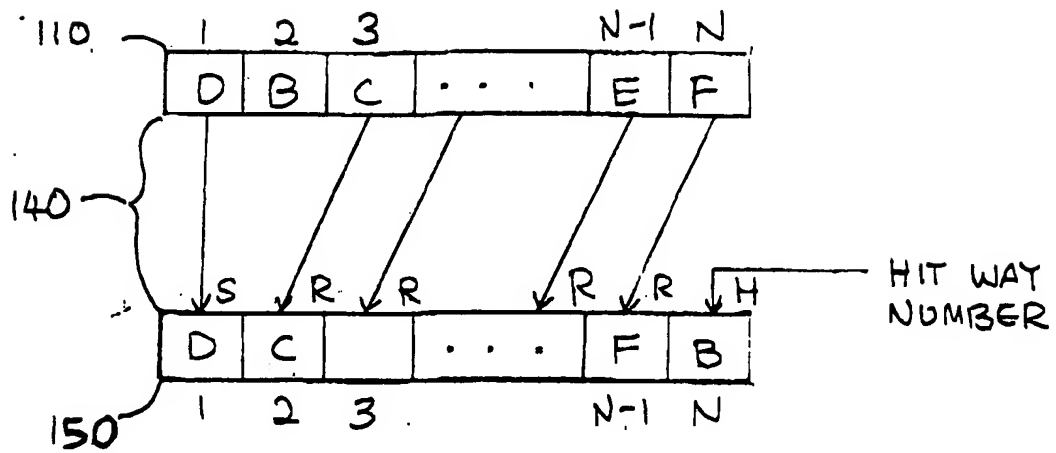


Figure 4

Replacement order generator producing new replacement order when a reference is a hit on element residing in way B.

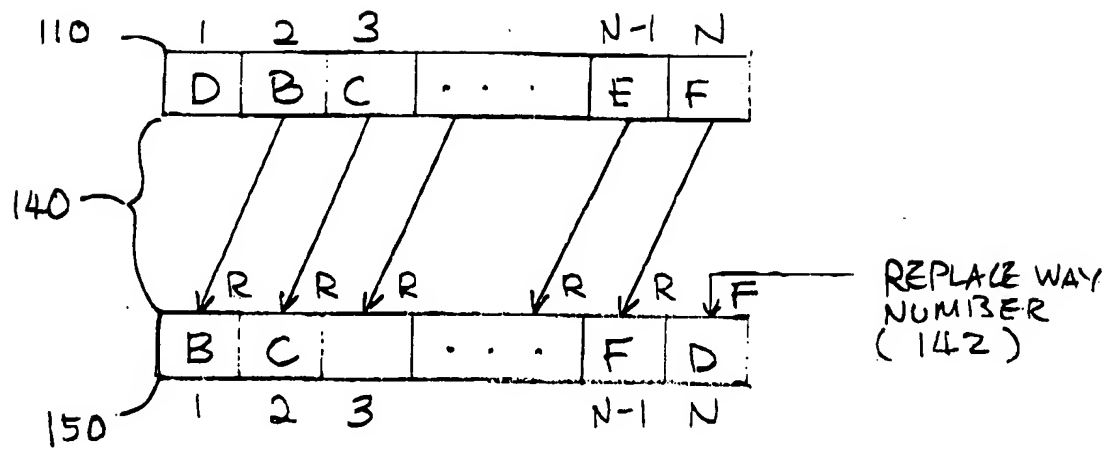


Figure 5

Replacement order generator producing new replacement order when a reference is a miss.

Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8
miss	R	R	R	R	R	R	R	F
hit 1	R	R	R	R	R	R	R	H
hit 2	S	R	R	R	R	R	R	H
hit 3	S	S	R	R	R	R	R	H
hit 4	S	S	S	R	R	R	R	H
hit 5	S	S	S	S	R	R	R	H
hit 6	S	S	S	S	S	R	R	H
hit 7	S	S	S	S	S	S	R	H
hit 8	S	S	S	S	S	S	S	H/S

Table 1

FIGURE 5A

10045427-102604

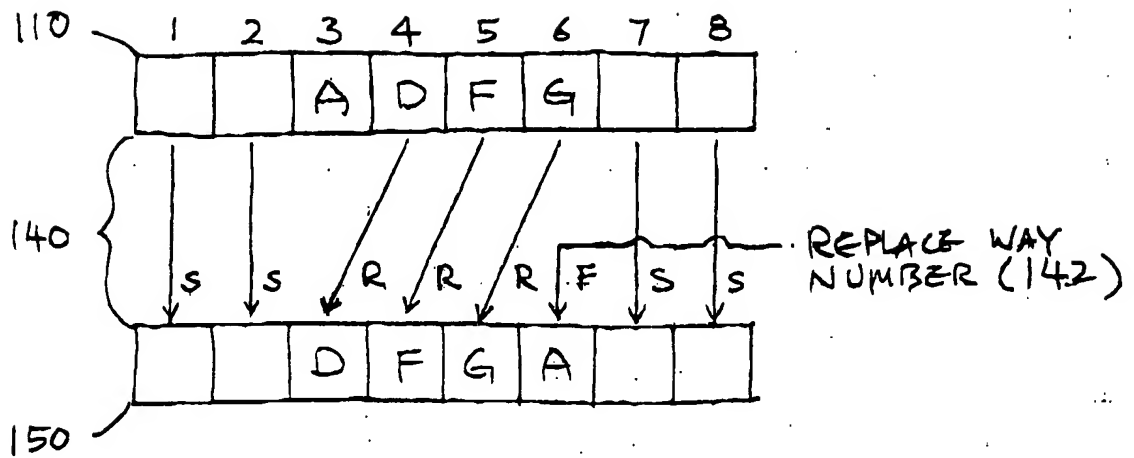


Figure 6

When a reference is a miss and the reference partition consists of positions 3-6.

10045127-100691

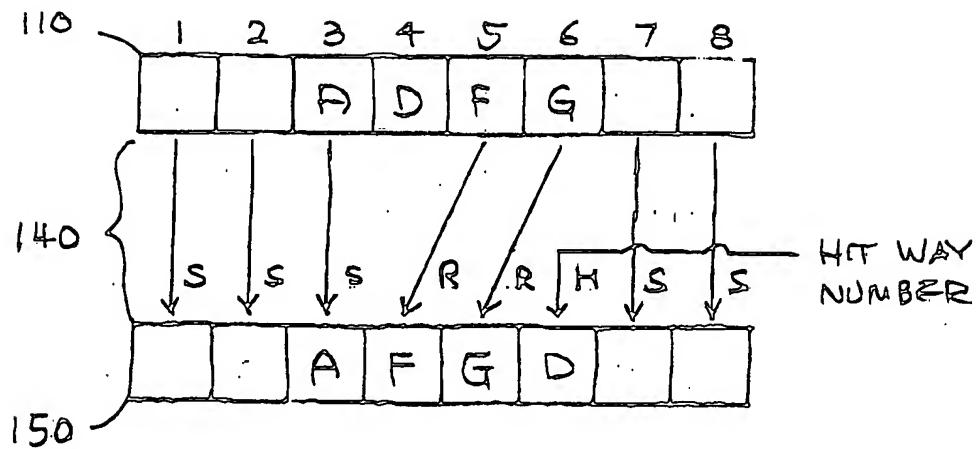


Figure 7

When a reference hits on way D, that resides in a position within the reference partition consisting of positions 3-6.

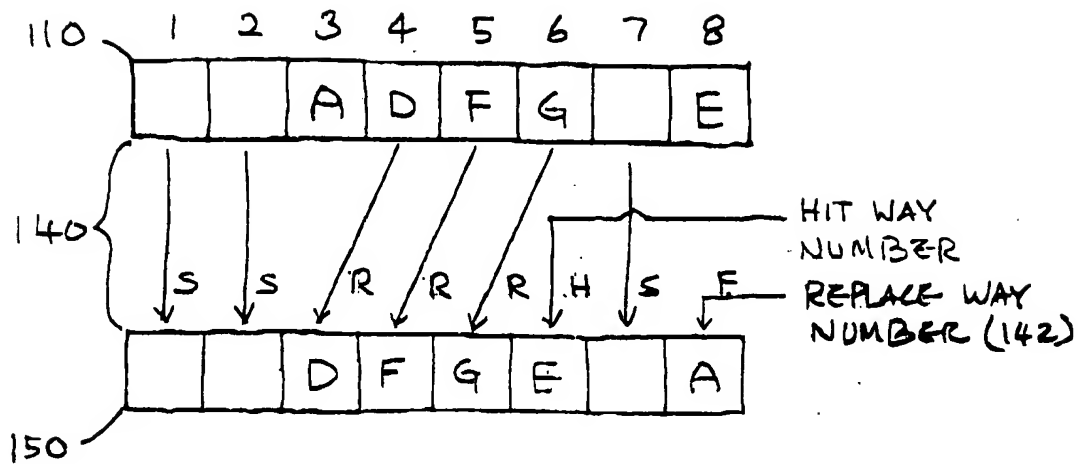


Figure 8

position When a reference hits on way E that resides in a position outside the reference partition consisting of positions 3-6.

10045127-102501

ID	Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8	Fsel
Y	miss	S	S	R	R	R	F	S	S	3
Y	hit 1	F	S	R	R	R	H	S	S	3
Y	hit 2	S	F	R	R	R	H	S	S	3
Y	hit 3	S	S	R	R	R	H	S	S	3
Y	hit 4	S	S	S	R	R	H	S	S	3
Y	hit 5	S	S	S	S	R	H	S	S	3
Y	hit 6	S	S	S	S	S	H/S	S	S	3
Y	hit 7	S	S	R	R	R	H	F	S	3
Y	hit 8	S	S	R	R	R	H	S	F	3

Table 2

FIGURE 8A

TABLE 2

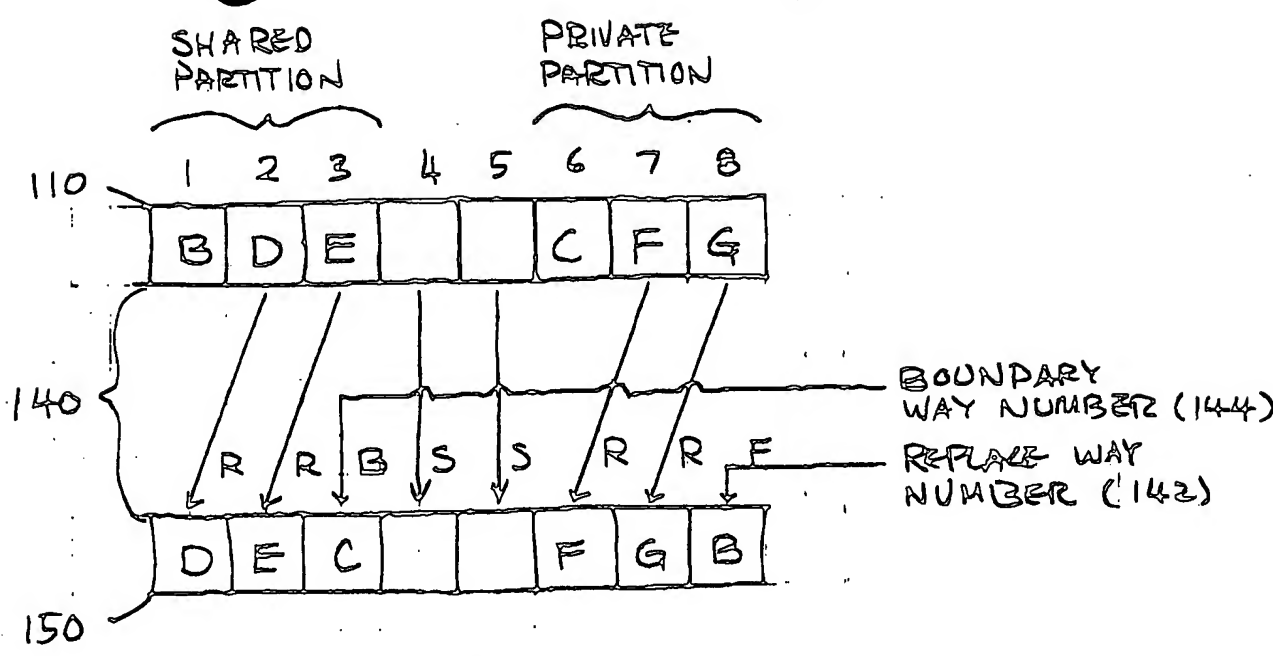


Figure 9. MISS

10045122-102601

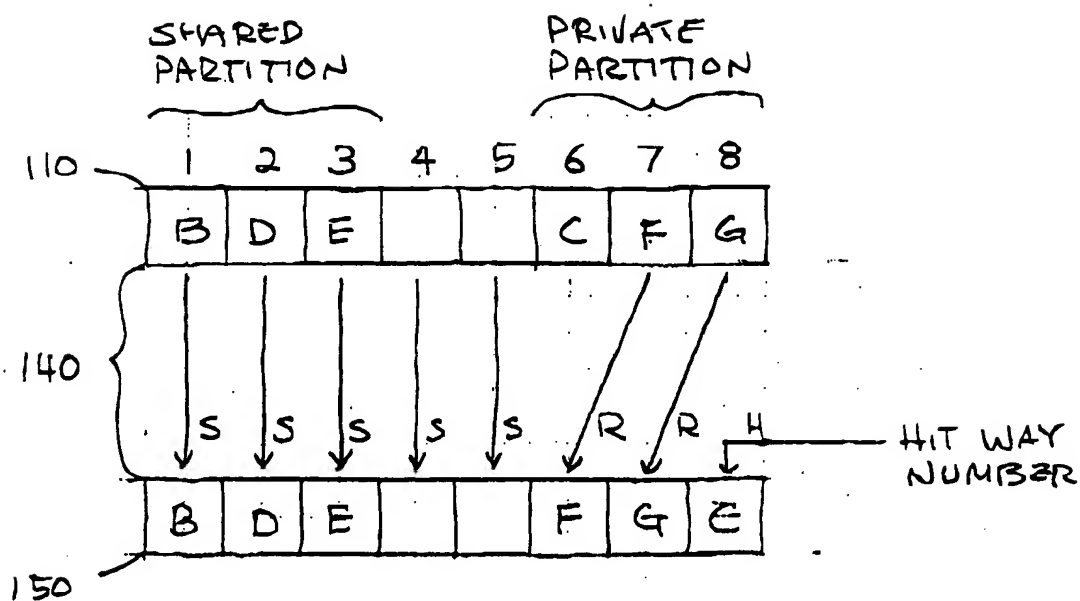


Figure 10.

Hit on way C, which resides in private partition.

10045127 102501

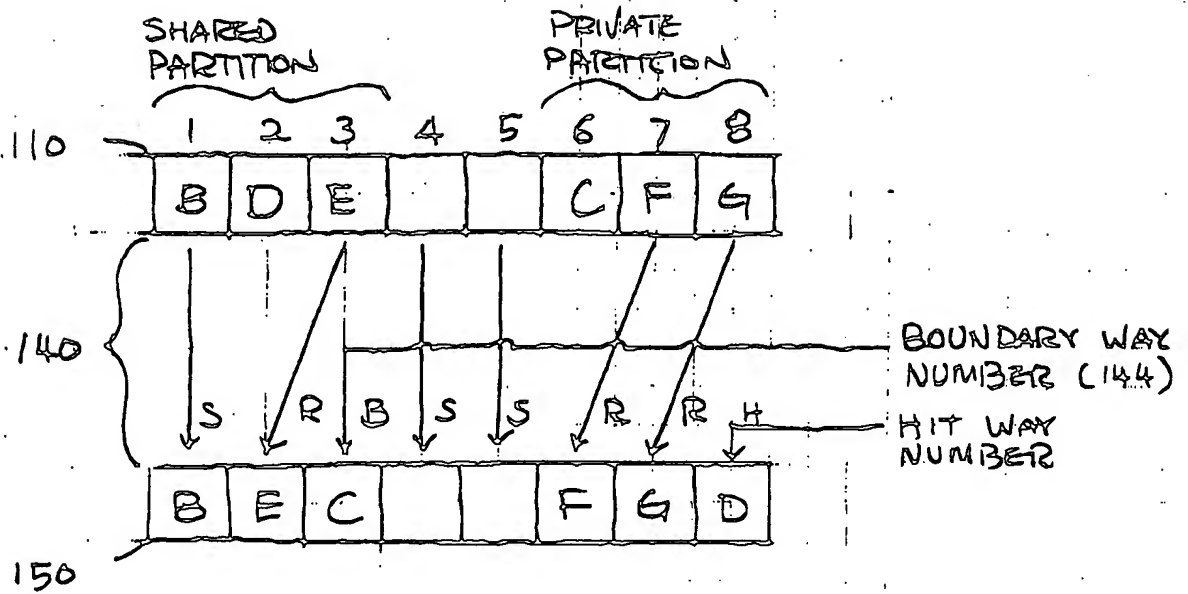


Figure 11

Hit on way D, which resides in shared partition

10045127-102501

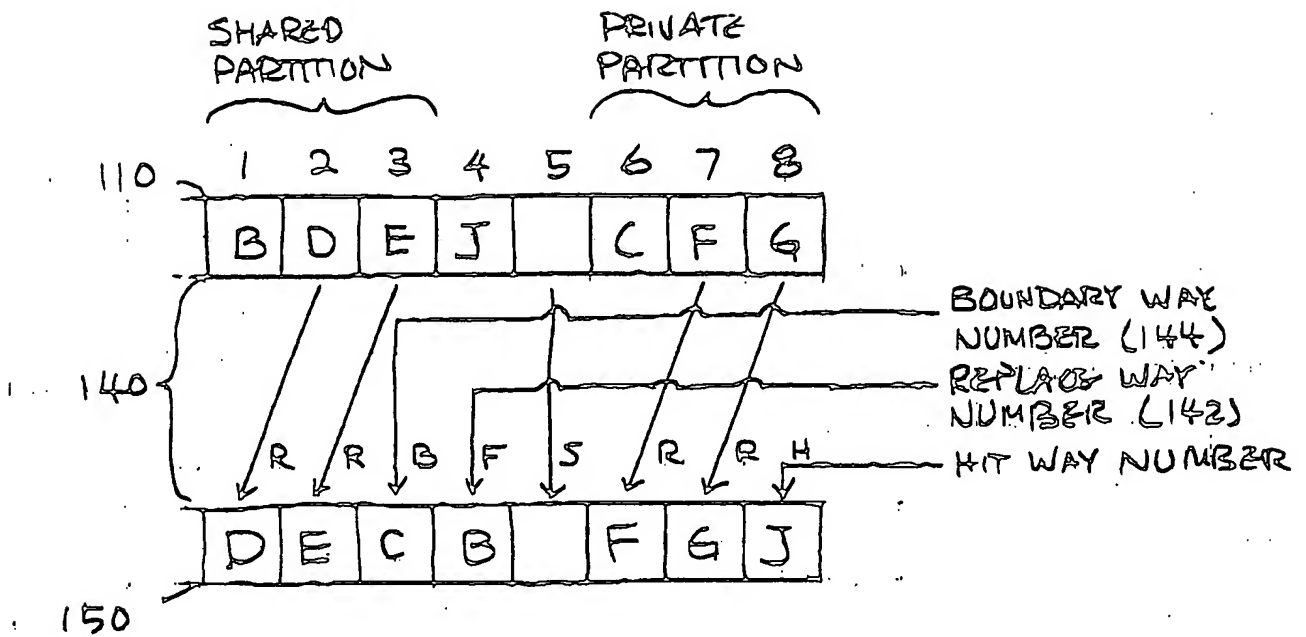


Figure 12

Hit on way J, which resides outside the shared and private partitions.

10045127-102604

ID	Access Result	mux 1	mux 2	mux 3	mux 4	mux 5	mux 6	mux 7	mux 8	Fsel	Bsel
W	miss	R	R	B	S	S	R	R	F	1	6
W	hit 1	R	R	B	S	S	R	R	H	1	6
W	hit 2	S	R	B	S	S	R	R	H	1	6
W	hit 3	S	S	B	S	S	R	R	H	1	6
W	hit 4	R	R	B	F	S	R	R	H	1	6
W	hit 5	R	R	B	S	F	R	R	H	1	6
W	hit 6	S	S	S	S	S	R	R	H	1	6
W	hit 7	S	S	S	S	S	S	R	H	1	6
W	hit 8	S	S	S	S	S	S	S	H/S	1	6

Table 3

FIGURE 12A

10045427-102601

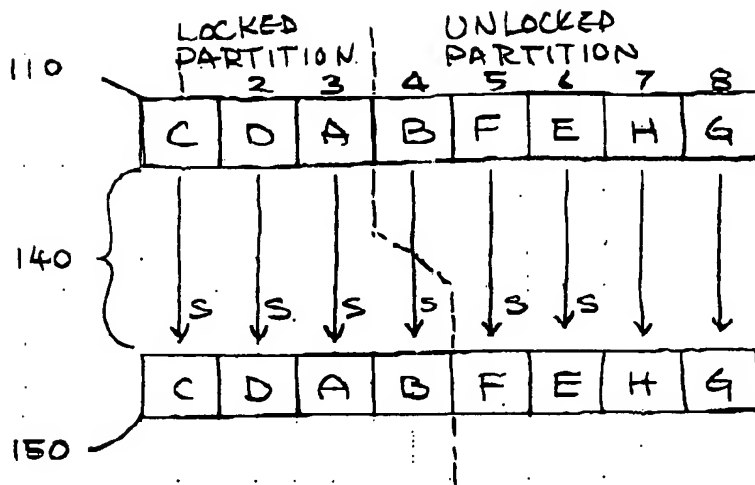


Figure 13.

Locking an element that is not in the caching device.

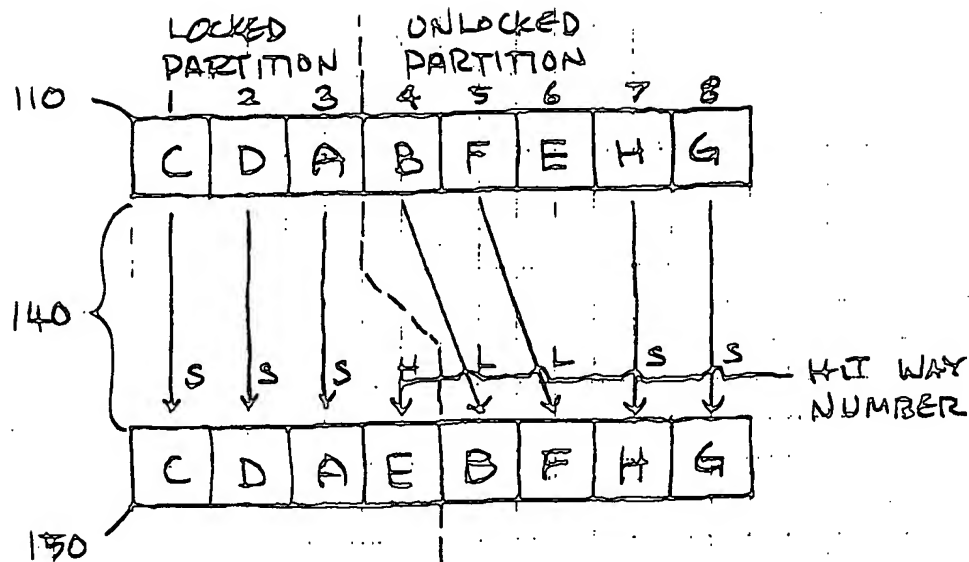


Figure 14.

Locking an element that is in caching device but is unlocked.

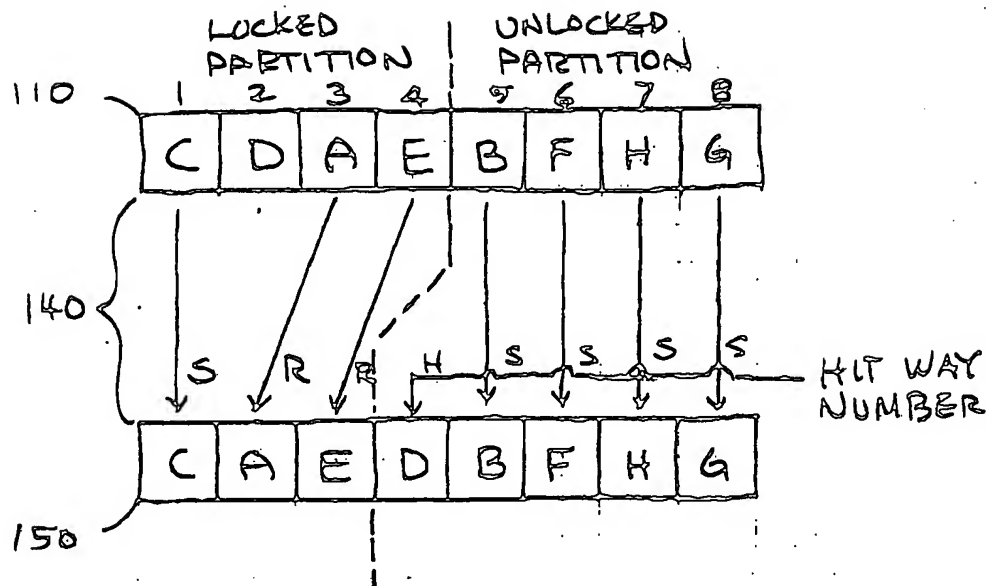


Figure 15

Unlocking an element that is in caching device .